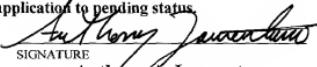


FORM PTO-1390 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE (REV 10-2000)		ATTORNEY'S DOCKET NUMBER HHI-033US
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C.371		
INTERNATIONAL APPLICATION PCT/DE00/00191	INTERNATIONAL FILING DATE 21 January 2000 (21.01.00)	U.S. APPLICATION NO. <i>(Unknown)</i> see 37 CFR 1.5 09/890227 PRIORITY DATE CLAIMED 27 January 1999 (27.01.99)
TITLE OF INVENTION AUDITORY TREATMENT DEVICE		
APPLICANT(S) FOR DO/EO/US Hans-Dieter BOROWSKY, et al.		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
<ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C.371. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. <input type="checkbox"/> This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)). <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (PCT Article 31). <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). <input checked="" type="checkbox"/> has been communicated by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C 371(c)(2)) (9 sheets). <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). <input type="checkbox"/> have been communicated by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input checked="" type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)), (unexecuted) (4 Sheets); <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). 		
Items 11. to 16. below concern document(s) or information included:		
<ol style="list-style-type: none"> 11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98 (3 sheets) with Form PTO-1449 (1 sheet) and cited references (2 sheets); 12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included 13. <input checked="" type="checkbox"/> A FIRST preliminary amendment (4 sheets) (along with version of markings to show changes (3 sheets)); <ol style="list-style-type: none"> <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 14. <input type="checkbox"/> A substitute specification. 15. <input type="checkbox"/> A change of power of attorney and/or address letter. 16. <input checked="" type="checkbox"/> Other items or information: Transmittal Letter (2 sheets in duplicate); PCT International Published Application (WO 00/45617) (without International Search Report) (15 sheets); PCT International Published Application (WO 00/45617) (with International Search Report) (4 sheets); International Preliminary Examination Report (9 sheets); Check in the amount of \$495 (Filing Fee) based on small entity; Certificate of First Class Mailing (1 sheet); and Return Postcard. 		

U.S. APPLICA 09/890227	INTERNATIONAL APPLICATION NO. PCT/DE00/00191	ATTORNEY'S DOCKET NO. HHI-003US																																									
		CALCULATIONS PTO USE ONLY																																									
<p>17. <input checked="" type="checkbox"/> The following fees are submitted:</p> <p>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) (a/o November 1, 2000):</p> <p>Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.....\$1000</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO\$860</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.455(a)(2)) paid to USPTO\$710</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4).....\$690</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4).....\$100</p>																																											
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<p>Surcharge of \$130.00 for furnishing the oath or declaration later than <input checked="" type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CLAIMS</th> <th>NUMBER FILED</th> <th>NUMBER EXTRA</th> <th>RATE</th> </tr> </thead> <tbody> <tr> <td>Total claims</td> <td>10-20 =</td> <td>0</td> <td>X \$18.00</td> </tr> <tr> <td>Independent claims</td> <td>1-3 =</td> <td>0</td> <td>X \$80.00</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>+ 270.00</td> </tr> <tr> <td colspan="3">TOTAL OF ABOVE CALCULATIONS =</td> <td>\$990.00</td> </tr> </tbody> </table> <p><input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by ½.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">SUBTOTAL =</th> <th>\$495.00</th> </tr> </thead> <tbody> <tr> <td colspan="2">Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).</td> <td>+ \$</td> </tr> <tr> <td colspan="2">TOTAL NATIONAL FEE =</td> <td>\$</td> </tr> <tr> <td colspan="2">Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property</td> <td>+ \$</td> </tr> <tr> <td colspan="2">TOTAL FEES ENCLOSED =</td> <td>\$495.00</td> </tr> <tr> <td colspan="2"></td> <td>Amount to be: refunded \$</td> </tr> <tr> <td colspan="2"></td> <td>charged \$</td> </tr> </tbody> </table>			CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	Total claims	10-20 =	0	X \$18.00	Independent claims	1-3 =	0	X \$80.00	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ 270.00	TOTAL OF ABOVE CALCULATIONS =			\$990.00	SUBTOTAL =		\$495.00	Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).		+ \$	TOTAL NATIONAL FEE =		\$	Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property		+ \$	TOTAL FEES ENCLOSED =		\$495.00			Amount to be: refunded \$			charged \$
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<p>a. <input checked="" type="checkbox"/> Checks in the amount of \$ 495.00 to cover the above fees are enclosed.</p> <p>b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 12-0080. A duplicate copy of this sheet is enclosed.</p>																																											
<p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p>																																											
<p>SEND ALL CORRESPONDENCE TO:</p> <p>Anthony A. Laurentano, Esq. LAHIVE & COCKFIELD, LLP 28 State Street Boston, Massachusetts 02109 United States of America (617)227-7400 Date: 27 July 2001</p>																																											
<p> SIGNATURE Anthony A. Laurentano</p> <p>NAME 38,220</p> <p>REGISTRATION NUMBER</p>																																											

IN THE UNITED STATES PATENT DESIGNATED OFFICE (DO/US)
(National Phase of International App.: PCT/DE00/00191, W/O 00/45617)

In re the
application of: **Hans-Dieter BOROWSKY et al.**

International Application No.: **PCT/DE00/00191**

International Filing Date: **21 January 2000**

U.S. Serial No.: **Not Yet Assigned**

Filed: **Herewith**

For: **AUDITORY TREATMENT DEVICE**
(amended)

Attorney Docket No.: **HHI-033US**

BOX PCT
Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Preliminary to examination of the above-referenced patent application, please amend the enclosed above-titled International patent application as follows.

In the Specification

Page 1, line 1, change the title to "**AUDITORY TREATMENT DEVICE**".

Page 1, line 2, after the title, insert the following "**Background of the Invention**".

Page 1, lines 3-4, please replace the paragraph with the following:

The invention relates to an auditory treatment device for correcting hearing impairments.

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Page 1, line 33, insert the following title: "**Summary of the Invention**".

Page 2, lines 1-2, please delete this paragraph.

Page 5, line 27, insert the following title: "**Brief Description of the Drawings**".

Page 5, line 30, please insert the following title: "**Description of Illustrated Embodiment**".

In the Claims

Please amend claims 1-11 as follows:

1. (Amended) A treatment device for correcting impairments to hearing, comprising an essentially cylindrically shaped housing formed of metal, the housing having a battery compartment and a sound exit opening, wherein the housing completely surrounds and shields an electronics unit located therein against electromagnetic waves.
2. (Amended) The treatment device according to claim 1, wherein the battery compartment comprises a watertight seal from the rest of the housing.
3. (Amended) The treatment device according to claim 1, wherein the sound exit opening is sealed by an acoustically transmitting, watertight film.
4. (Amended) The treatment device according to claim 2, wherein the sound exit opening is sealed by an acoustically transmitting, watertight film.

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5. (Amended) The treatment device according to claim 1, wherein the housing comprises a first housing component with the battery compartment being fastened together with a second housing component and an O-ring seal (3) being located therebetween.

6. (Amended) The treatment device according to claim 1, wherein the treatment device is free of external moving operating elements.

7. (Amended) The treatment device according to claim 1, wherein the housing is composed of titanium or a titanium alloy.

8. (Amended) The treatment device according to claim 1, further comprising retaining means provided in the battery compartment to fix the position of a battery therein.

9. (Amended) The treatment device according to claim 8, wherein the battery compartment further comprises a hole of small diameter for allowing external access to the battery.

10. (Amended) The treatment device according to claim 8, wherein the retaining means comprise a magnet.

11. (Amended) The treatment device according to claim 10, wherein the magnet comprises a ring magnet, and wherein the battery compartment comprises a hole for allowing external access to the battery, the hole exiting into a center recess of the ring magnet.

Docket No.: HHI-033US

REMARKS

Applicants amend the specification to address minor formal matters, such as introducing appropriate section headers. Applicants also amend the claims to remove multiple dependencies, to provide proper antecedent basis, and to address other matters of form. The foregoing amendments introduce no new matter and are not related to issues of patentability.

Entry of the foregoing Preliminary Amendment is respectfully in order and requested.

If there are any questions regarding the amendments to the application, we invite the Examiner to call Applicants' representative at the telephone number below.

Respectfully submitted,

LAHIVE & COCKFIELD, LLP



Anthony A. LaPantano
Registration No. 38,220
Attorney for Applicants

28 State Street
Boston, MA 02109
(617) 227-7400

Date: July 27, 2001

VERSION TO SHOW MARKINGS WITH CHANGES MADE

In the Specification

Page 1, line 1:

~~HEARING AID AUDITORY TREATMENT DEVICE~~

Page 1, lines 3-4:

The invention relates to an auditory treatment device according to the preamble of Claim 1 for correcting hearing impairments.

In the Claims:

Please amend claims 1-11 as follows:

1. (Amended) A ~~T~~treatment device for correcting impairments to hearing, comprising an essentially cylindrically shaped ~~formed~~ housing of metal, the housing having a battery compartment ~~as well as~~ and a sound exit opening, ~~characterized in that~~ wherein the housing completely surrounds and shields the ~~an~~ electronics unit located therein the treatment device (1) against electromagnetic waves, ~~and that the housing (2) has an essentially cylindrical shape.~~

2. (Amended) The ~~T~~treatment device according to claim 1, ~~characterized in that~~ wherein the battery compartment (7) ~~has~~ comprises a watertight seal from the rest of the housing (2).

3. (Amended) The ~~T~~treatment device according to claims 1 or 2, ~~characterized in that~~ wherein the sound exit opening (5) is sealed by an acoustically transmitting, watertight film.

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4. (Amended) The Treatment device according to one of the foregoing claimsclaim 2, characterized in that wherein the sound exit opening (4) is provided in the housing (2), which opening is sealed by an acoustically transmitting, watertight film.

5. (Amended) The Treatment device according to one of the foregoing claimsclaim 1, characterized in that wherein the housing (2) has two sections (2a, 2b), the comprises a first housing component (2b) with the battery compartment (7) being screwed fastened together with another a second housing component (2a) and an O-ring seal (3) being located in the screw section therebetween.

6. (Amended) The Treatment device according to one of the foregoing claimsclaim 1, characterized in that wherein the treatment device (1) is free of external moving operating elements.

7. (Amended) The Treatment device according to one of the foregoing claimsclaim 1, characterized by a wherein the housing (2) is composed of titanium or a titanium alloy.

8. (Amended) The Treatment device according to one of the foregoing claimsclaim 1, characterized in that further comprising retaining means are provided in the battery compartment (7) to fix the position of the a battery therein.

9. (Amended) The Treatment device according to claim 8, characterized in that wherein the battery compartment further comprises a hole (9) of small diameter is located in the battery compartment (7) such that the small hole (9) allows for allowing external access to the battery.

10. (Amended) The Treatment device according to claim 8, characterized in that wherein the retaining means are designed as comprise a magnet.

11. (Amended) The Treatment device according to claims 9 and 10, characterized in that wherein the magnet is designed as comprises a ring magnet (8), and wherein the

battery compartment comprises a hole for allowing external access to the battery, the hole
~~(9)~~ exiting into ~~the~~ a center recess of the ring magnet ~~(8)~~.

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AUDITORY TREATMENT DEVICE

The invention relates to a treatment device according to the preamble of

Claim 1.

5

German patent DE 38 40 393 C3 discloses such a treatment device which is worn in the ear. It has a pear-shaped or mushroom-shaped contour and contacts the auditory canal and external ear. The term "housing" is used to designate only the part contacting the skin of the wearer, which part actually belongs to a two-part housing, the 10 outwardly visible front of the device being designed in the familiar fashion as a "cover plate" or "face plate" on which the entire electronics unit of the treatment device is located. These cover plates are composed of plastic which is normally designed to match the visual color of the ear since this cover plate is visible when the user wears it, whereas the metallic housing component extending into the ear is not visible.

15

The so-called "housing" is thus positioned simply like a hood on this cover plate and may be individually form-fitted to the individual patient. This "housing" may in fact be fabricated of metal to form an electrode which, interacting with a second electrode, forms an automatic on/off switch which automatically switches the device on 20 when it is inserted into the ear and which also reduces the resistance between the electrodes due to skin moisture.

Due to the growing use of small, electronic devices used adjacent to the head, such as cellular or cordless telephones, generic treatment devices are often 25 exposed to radiated noise, or may themselves generate radiated noise which interferes with such devices.

Due to the ever-smaller dimensions achievable for the electronics unit, and thus for the entire treatment devices for which miniaturization is desirable for 30 cosmetic reasons, there exists the added risk of unintended damage to the treatment device when it is inadvertently ignored, or for example, loosens from or falls out of the wearer's ear during exercise.

The object of the invention is thus to improve a generic treatment device 35 such that it permits the wearer to pursue the most active lifestyle possible while remaining as insusceptible as possible to mechanical and electronic disturbances.

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This fundamental objective of the invention is achieved by a treatment device having the characteristic features of Claim 1.

The invention proposes, in other words, fabricating the housing of the
5 treatment device completely, rather than partially, from metal so that the electronics unit of the treatment device is shielded on all sides. This approach ensures on the one hand that external interfering pulses do not disturb the hearing aid, and secondly, that any pulses emanating from the hearing aid are suppressed and cannot disturb external devices.

10

Additionally, the metallic housing creates excellent mechanical strength which considerably exceeds the strength exhibited by treatment devices that are normally made of plastic. Tests have demonstrated that a person can stand on such a metal treatment device and that it may be run over by a truck, yet remain completely 15 functional.

This mechanical strength essentially results from the basic cylindrical shape of the housing, although barrel-shaped or slightly banana-shaped-and-bent longitudinal contours or polygonal cross-sectional contours are also possible and are 20 subsumed under the term "essentially cylindrical" of the present invention.

In addition to this fundamental mechanical and electrical strength of the hearing aid, a special feature protecting against fluids may be added. The term "fluids" according to the invention here does not cover all possible fluids, for example 25 aggressive acids or the like, but such fluids as would normally be found around the house or during leisure activities and to which the treatment device would normally be exposed, such as perspiration or personal hygiene products, as well as water, possibly mixed with detergents. The terms "water" or "watertight" are always used hereinbelow merely as examples of these previously known fluids.

30

To meet this requirement, the battery compartment may be designed to be watertight relative to the rest of the housing, a number of well-known approaches being available to an individual skilled in the art: A watertight clip feature securing the battery-compartment lid to the rest of the housing may be used, or a circumferential 35 elastomer seal on the battery compartment or lid of the battery compartment may be provided, or a watertight seal of the battery compartment or battery-compartment lid may be achieved by a labyrinthine contour.

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In connection with this watertight feature, it is additionally advantageous to provide a watertight seal for the sound exit opening. For this purpose, the invention provides a film which is acoustically transmitting yet still watertight so that this film 5 provides the last barrier to any incoming water which might otherwise penetrate the interior of the treatment device and cause damage. A suitable film, for example, might be one made of a stretched plastic such as that known under the trade name "Gore-Tex."

Devices according to the invention may, for example, be designed as a 10 tinnitus masker having only one sound exit opening for transmitting the treatment sounds. However, it is also advantageous to provide, in addition to the sound outlet opening, a sound receiving opening which also has a watertight seal using a film as described above. It is the sound receiving opening which transforms the treatment device into a hearing aid which transmits the received sounds in amplified form. If 15 needed, two separate films may be employed at the two openings.

In the event the housing has two openings and both openings have a watertight seal, an advantageous approach, both in terms of cost and assembly, is to use one single piece of film. An acoustic separation of the films at both openings may be 20 provided so as to preclude any effect from noise emitted at the sound exit opening due to sound events picked up at the sound receiving opening. The sections of a single film associated with the two openings can be separated acoustically from one another by having at least one of these sections delimited by a frame which prevents the transmission of vibrations from one section to the other. For example, the frame may be 25 formed by a ring surrounding one of the sections, or it may surround both sections in an octagonal shape, or it may be formed by a component which adjoins the film and which has one opening in the area of each film section.

The housing may advantageously have two components, one containing 30 the battery compartment and the other accommodating the actual electronics unit of the treatment device. Both components may be screwed together such that to open the battery compartment, in place of a hinge arrangement, one simply unscrews the component of the housing containing the battery from the other component.

35 The thread has a circular cross-section and facilitates simple and reliable sealing of the battery compartment through the use of commercially available and inexpensive O-rings. In addition, this arrangement permits the treatment device to be

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easily switched on and off by unscrewing the component containing the battery compartment from the other component of the treatment device – thereby avoiding the need for any externally operated on/off switch which would be movable and would require a watertight seal. The invention thus facilitates a reliable watertight seal and

5 inexpensive fabrication of the treatment device.

This two-part design of the housing, the arrangement of the thread and O-ring seal, and the manipulation of this type of treatment device, especially the screw movement, are all facilitated by the essentially cylindrical shape of the housing.

10 An additional advantageous feature may be provided in which no movable external operating elements at all are provided in the treatment device, for example, rotatable potentiometers, toggle switches, or pushbuttons. This approach facilitates sealing the treatment device, thereby enhancing the reliability of the treatment

15 device and reducing its production costs.

The housing may advantageously be composed of titanium or a titanium alloy: This feature provides an allergen-free or low-allergen housing which additionally exhibits high mechanical strength and resistance to chemicals, and due to its low weight

20 provides a high level of wearing comfort, which additionally guarantees reliable electrical shielding of the electronics unit, and which may have a variety of designs based on appropriate surface treatment, for example, anodizing, and is thus easily tailorable to the wishes of the customer in terms of the visual appearance of the treatment device.

25 Retaining means may advantageously be provided which fix the battery in its position inside the battery compartment. Such retaining means allow for the elimination of a separate on/off switch: With the battery retained in the battery compartment, appropriate movement of the battery compartment relative to the rest of

30 the housing can enable the device to turn on or off through said movement, since contact between the battery and the actual electronics unit of the treatment device may be made or broken by such movement.

In order to ensure that the use of such retaining means permits the battery

35 to be safely removed from the battery compartment, despite the limitations of fine-motor skills, a drilled hole of small diameter may advantageously be provided in the battery compartment. When the battery needs to be replaced, a type of pin may, for example, be

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inserted through this hole into the battery compartment to loosen the battery from its holder.

These retaining means may be simply and advantageously designed as a magnet. This approach ensures sufficient retaining force, on the one hand, and easy removability of the battery on the other. Unlike the use of mechanical retaining means, for example clips or the like, this feature precludes a situation in which, due to wear on such retaining means, the secure retention of the battery can no longer be ensured as the service life of the treatment device increases.

10

The magnet may advantageously be designed as a ring magnet, either as one piece or composed of multiple components, in which the recess of this ring magnet is located over the aforementioned small hole of the battery compartment so as to allow easy ejection of the battery in the manner described.

15

The proposed auditory treatment device may, for example, be designed as an in-ear or behind-the-ear device. Appropriately shaped sound tubes which transmit the sound from the sound exit opening of the housing to the vicinity of the eardrum of the user may be removably connected to the housing, for example, by means of a thread.

20 The sound tubes may thus be removed if damaged or for cleaning. Additionally, given sufficiently small dimensions, the same housing may selectively be worn in the ear or behind the ear based on the use of an appropriate sound tube.

An embodiment of the invention is described in detail based on the drawing.

Reference 1 indicates a general treatment device which has a two-part housing 2 made of a titanium alloy. The upper housing component 2a contains the electronics unit of the treatment device, while component 2b shown at the bottom 30 contains a battery compartment 7 of treatment device 1. The two components 2a and 2b are screwed together, an O-ring 3 located in the screw section allowing for the design of completely watertight housing 2.

Treatment device 1 is designed as a hearing aid. It has a sound receiving 35 opening 4 behind which a microphone is located. Sound receiving opening 4 is sealed off by a watertight yet acoustically transmitting film. Additionally, housing component 2a has a sound exit opening 5 through which sounds are transmitted to the ear of the

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patient or wearer of the treatment device. These sounds are transmitted from the sound exit opening through a sound tube 6 into the ear of the wearer of treatment device 1.

Sound tube 6 connects in a watertight fashion to housing component 2a

5 and is, in other words, open only in the area of its front free end, thus often preventing the penetration of fluid. In addition, however, sound exit opening 5 is also sealed by a watertight yet acoustically transmitting film, thus preventing the penetration of moisture into housing component 2a in this case as well. The electronics unit located in housing component 2a is also accommodated in a watertight fashion in housing component 2a,

10 for example, glued in a watertight fashion, thus forming a water barrier to battery compartment 7.

These electronics units may have contacts on their bottom side facing the interior of housing component 2b, thus permitting the aforementioned contacts to

15 connect to a battery located in battery compartment 7. These or other contacts may also serve as a connecting feature for external programming devices such that, with housing component 2b removed, the electronics unit of treatment device 1 may be modified, for example programmed, and adjusted to the hearing level of the patient.

20 Located within battery compartment 7 is a ring magnet 8 which holds the
battery located in battery compartment 7 in its prescribed position. When housing
component 2b is unscrewed from housing component 2a, this ring magnet 8 ensures that
the battery is removed from the contacts of the electronics unit of the treatment device 1,
thereby automatically switching off the treatment device without having to actuate a
25 separate switch provided for this purpose. Using ring magnet 8, it is possible to switch
off treatment device 1 by a slight rotary movement, thereby sparing O-ring 3 and
precluding hazards from affecting O-ring 3 since housing component 2b need not be
completely unscrewed each time from housing component 2a in order to switch the
device off.

In housing component 2b, there is provided a lower hole 9 of small diameter which exits into the central opening of ring magnet 8. When a small-diameter tool is inserted into hole 9, this tool, for example a pin, may be used to loosen the battery from ring magnet 8 and remove it from battery compartment 7.

Hole 9 additionally permits air to enter the battery compartment, thereby ensuring problem-free operation when, for example, zinc-air batteries are employed.

Due to the small diameter of hole 9, and the arrangement of the battery and ring magnet 8, which together form a type of labyrinth seal, the interior of housing component 2b remains watertight for the common practical uses of an auditory treatment device, despite the presence of hole 9, especially since lower housing component 2b connects in

5 a water-tight and air-tight fashion to upper housing component 2a, with the result that lower housing component 2b has its hole 9 simply as a one-sided opening such that, lacking a second venting hole and due to the small diameter of hole 9, any displacement of the air contained in battery compartment 7 and resulting penetration of moisture is impeded.

10 In the event there are more stringent requirements in terms of impermeability for the treatment device, as a variation from the embodiment presented, a water barrier may be provided between the magnet and the battery, for example, in the form of a film bag inserted into housing component 2b. The small thickness of the

15 material ensures that the holding force of the magnet is sufficient. The bag shape allows the film material to deform considerably, thus enabling the battery to be ejected by using hole 9. By using an air-permeable film material, any type of battery may be used without problems.

20 Reference 10 indicates a film which is both watertight and acoustically transmitting due to extremely small pores. Based on the small dimensions of treatment device 1, a single piece of film is provided to facilitate assembly. In order to prevent the vibrations of this film 10 from mutually impairing both the pickup and exit of sound, both of the film sections at these openings are acoustically separated, for example, by a

25 frame which separates at least one of the two sections from the other section. This type of frame may be formed either by the upper side of the unit containing the electronics unit or a separate component.

The dimensions of treatment device (1) may be kept comparatively small.

30 For example, given a diameter of about 1 cm and an overall length of about 2 cm, it may be worn, for example, either as a retroauricular treatment device behind the ear, or also in the ear.

The surface design of housing 2 may be matte, corrugated or noncircular

35 so as to facilitate a secure grasp when the two housing components 2a and 2b are screwed together or unscrewed.

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Claims

1. Treatment device for correcting impairments to hearing, comprising a housing of metal, the housing having a battery compartment as well as a sound exit opening, characterized in that the housing completely surrounds and shields the electronics unit located in the treatment device (1) against electromagnetic waves, and that the housing (2) has an essentially cylindrical shape.

5 2. Treatment device according to claim 1, characterized in that the battery compartment (7) has a watertight seal from the rest of the housing (2).

10 3. Treatment device according to claims 1 or 2, characterized in that the sound exit opening (5) is sealed by an acoustically transmitting, watertight film.

15 4. Treatment device according to one of the foregoing claims, characterized in that a sound exit opening (4) is provided in the housing (2), which opening is sealed by an acoustically transmitting, watertight film.

20 5. Treatment device according to one of the foregoing claims, characterized in that the housing (2) has two sections (2a, 2b), the housing component (2b) with the battery compartment (7) being screwed together with another housing component (2a) and an O-ring seal (3) being located in the screw section.

25 6. Treatment device according to one of the foregoing claims, characterized in that the treatment device (1) is free of external moving operating elements.

7. Treatment device according to one of the foregoing claims, characterized by a housing (2) composed of titanium or a titanium alloy.

30 8. Treatment device according to one of the foregoing claims, characterized in that retaining means are provided in the battery compartment (7) to fix the position of the battery.

35 9. Treatment device according to claim 8, characterized in that a hole (9) of small diameter is located in the battery compartment (7) such that the small hole (9) allows external access to the battery.

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10. Treatment device according to claim 8, characterized in that the retaining means are designed as a magnet.

11. Treatment device according to claims 9 and 10, characterized in that the magnet is designed as a ring magnet (8), the hole (9) exiting into the center recess of the ring magnet (8).

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#4

**DECLARATION, PETITION AND POWER OF ATTORNEY
FOR PATENT APPLICATION**

(Check one):

Declaration Submitted with Initial Filing
 Declaration Submitted after Initial Filing

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

AUDITORY TREATMENT DEVICE

the specification of which (check one):

is attached hereto.
OR
 was filed on 21 January 2000 as PCT International Application Number
PCT/DE00/00191 and filed as U.S. Patent Serial No. 09/890,227.
 and was amended by PCT Article 19 Amendment on _____
(if applicable),
 and was amended by PCT Article 34 Amendment on _____
(if applicable).

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

Docket # 722068860

PRIORITY CLAIM

(Check one):

no such applications have been filed.
 such applications have been filed as follows

1) FOREIGN PRIORITY CLAIM: I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate or §365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (dd/mm/yyyy)	Priority Not Claimed	Certified Copy Attached Yes No
199 03 090.1	DE	27 January 1999 (27.01.1999)	<input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>
299 10 318.8	DE	14 June 1999 (14.06.1999)	<input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>

Additional foreign application numbers are listed on a supplemental priority sheet attached hereto.

2) PROVISIONAL PRIORITY CLAIM: I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below.

Provisional Application Number(s)	Filing Date (dd/mm/yyyy)

Additional provisional application numbers are listed on a supplemental priority sheet attached hereto.

3) U.S./PCT PRIORITY CLAIM: I hereby claim the benefit under Title 35, United States Code, §120 of any United States application or §365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application Number	PCT Parent Number	Parent Filing Date (dd/mm/yyyy)	Parent Patent Number (if applicable)

Additional U.S. or PCT international application numbers are listed on a supplemental priority sheet attached hereto.

POWER OF ATTORNEY:

As a named inventor, I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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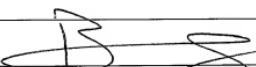
Direct Telephone Calls to: (name and telephone number)

Anthony A. Laurentano, (617) 227-7400

Wherefore I petition that letters patent be granted to me for the invention or discovery described and claimed in the attached specification and claims, and hereby subscribe my name to said specification and claims and to the foregoing declaration, power of attorney, and this petition.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

100

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4-14/4